

## ATTACHMENT H

### Possible Cost Impacts on the Department of Defense's Cleanup Program from Inability to Select the Remedy\*

#### Part I

The Department of Defense has estimated costs impacts of states' having the authority to change the selected remedy. The estimates are extrapolated from the examples provided below.

Installation	Sites Requiring Remedy Change / Total Sites per Installation	Remedy Selected by Department of Defense	Remedy Preferred by State	Cost Impact
Eielson AFB	3 of 66 sites	Institutional controls, long-term monitoring, geosynthetic cap	30-year pump & treat system and repairs to existing cap	\$28M
U.S. Air Force Academy	2 of 13 sites	Evapotranspiration landfill cap	Traditional landfill cap	\$4M
Air Force Plant #4	5 of 30 sites	Institutional controls, dual phase extraction, plume containment	RCRA landfill cap, slurry wall, long-term pump and treat	\$25M
Hill AFB	6 of 105 sites	Asphalt cap, natural attenuation	RCRA landfill cap, pump and treat system and resulting LTO	\$7.2M
Robbins AFB	2 of 39 sites	Landfill cover, hydraulic barrier for containment	Excavation and disposal, pump and treat	\$46M
NCBC Port Hueneme	1 of 27 sites	Landfill cap in compliance with municipal landfill guidelines	Hazardous waste landfill cap with an additional compact clay layer to prevent infiltration	\$5.8M+

In the above examples, 26 sites of the 252 sites at these 6 installations would require new remedies, with a potential additional cost of \$120 million, an average of \$4.6 million per site. As reported in the FY97 Defense Environmental Restoration Program Annual Report to Congress, 15,189 Department of Defense sites have not yet reached response complete. Assuming that states would change remedies at 1 percent of sites in the program, at an average additional cost of \$4.6 million per site, potential costs could reach almost \$700 million. If remedy changes were required at 5 percent of sites, additional costs could reach \$3.5 billion.

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\* Because cost impacts are difficult to predict and depend on how other parties and the courts interpret the S.8 amendment, the Department of Energy has chosen not to develop cost information.

## **Installation Background Information**

The following paragraphs contain additional background on the installations presented in the chart above.

### Eielson AFB

Three of the 66 sites at Eielson Air Force Base (AFB) would probably have had a change in remedy if the Department of Defense were not the lead agency. Two of the sites involved lead contamination. The remediation method strongly supported by the state was a long-term (30-year) pump-and-treat operation, at a total cost of about \$18 million. A technical impracticability waiver was obtained (with EPA support), and the remedy implemented at the sites was use of institutional controls and long-term monitoring. At the third site, a landfill, the state favored installation of an engineered geosynthetic cap encompassing about 60 acres, at a cost of \$10 million. Instead, the Air Force repaired the existing cap with EPA approval. At these three sites, use of the state-preferred remedies would have cost \$28 million more than the Air Force-implemented remedies, and the cleanup activities would have been delayed by 1 year.

### U.S. Air Force Academy

At 2 of 13 sites (landfills) at the Academy, Air Force proposed that the landfills be capped with an innovative evapotranspiration cap at a total cost of \$3 million. The state favored a traditional cap for these landfills, at a total cost of \$7 million.

### Air Force Plant #4

Approximately 5 of the 30 sites at AFP 4 would have required different remedies had the state been the lead agency. For Landfill LF003, the state supported a slurry wall; however, dual phase extraction was the selected remedy. For Landfill LF004, the State supported a RCRA cap, but the final remedy selected was institutional controls with long term monitoring. For the other three sites (SS016, LF001, and FT005), the Air Force took a risk based approach and implemented a final action designed to prevent the contamination from migrating offsite or to the aquifer that provides drinking water. The long-term pump and treat operations to achieve maximum contaminant levels (MCLs) supported by the state would have resulted in an additional expenditure of \$20M. Total additional expenditure at all five sites would have cost \$25M and would have delayed the program by two years.

### Hill AFB

Six of the 105 sites would have required different remedies had the state been the lead agency. The total cost impact would have been \$7.2M in present worth costs of systems construction and operation. One site, Berman Pond, was capped using an asphalt cap design that met all technical requirements for the project. The state supported a more costly, traditional RCRA multi layer cap. Because it had not been used in Utah before, there was resistance to its use. Without the leverage of lead agency authority Department of Defense would have had to install the RCRA cap as required by the state. The resulting innovative cap saved the Air Force \$1M over the more traditional RCRA cap. Five sites at Operable Unit 1 have created a 150-acre groundwater plume, contaminated with chlorinated solvents. The final remedy to clean up the off-base region is the use of natural attenuation as opposed to the state supported pump and treat system. A pump and treat system would have cost an additional \$1M in capital cost and \$10M in operational costs over the next 25 years.

### Robins AFB GA

Two of the 39 sites at Robins AFB would have required different remedies had the State been the lead agency. These two sites are Landfill No. 4 (LF04) and the Sludge Lagoon (WP14). If the state had selected the remedies, costs would have increased by \$46M and delayed cleanup to the IRP program by 2 years. Details are as follows: 1) At the Leachate Collection Project, the state wanted to dispose of all excavated wastes as RCRA Hazardous Wastes even though a cover was going to be placed over the site, which would have cost an additional \$14M and caused a ten month delay, 2) During the Drum Investigation, the state wanted to dispose of all excavated wastes as RCRA Hazardous Wastes even though a cover was going to be placed over the site, which would have cost an additional \$506K and caused a two-month delay, 3) As to the Groundwater Pump and Treat System, the state wanted to clean up the groundwater to MCLs instead of providing a hydraulic barrier for containment, which would have cost an additional \$32M and delayed the project 24 months.

### NCBC Port Hueneme

The landfill (Site 14) at Port Hueneme was used to dispose of dredge spoils, liquids, solid waste, and drums from various installation activities. Sampling results over the past 5 years show that groundwater contamination is not a concern. The main risk is from exposure to surface soil. The Navy is constructing a landfill cap based on municipal landfill guidelines. This will include a geosynthetic clay liner layer with drainage as the main barrier to infiltration. The cost is expected to be \$4.2 million. The state wanted a more standard RCRA cap with an additional compacted clay layer to prevent infiltration, even though infiltration is not a concern based on sampling results. If the state request were to be implemented, the construction costs would increase to \$10 million, not including redesign costs.

### MCB, Camp Pendleton (not included in the chart above)

A reduction of lead agency authority may increase cleanup costs, not only through remedy changes, but also through changes in sampling methods. The sampling method agreed upon at the installation (in a 1996 Federal Facility Agreement) was a DI-WET analysis suitable for evaluating impacts to groundwater due to potential leaching of metals. In 1998, the state would not sign the Record of Decision (ROD) because the state wants the Navy to use a Toxicity Characteristic Leaching Procedure (TCLP) sampling method. The disagreement is delaying the initiation of six remedial actions. If the state had the opportunity to unilaterally require that the TCLP sampling method be used, the sampling and analysis costs would skyrocket because work would have to be redone. To date, sampling and analysis costs incurred at Camp Pendleton are \$18 million over 6 years.

## **Part II**

The Department of Defense has also estimated cost impacts by using data from its Restoration Management Information System (RMIS) and final RODs for Department of Defense installations. The examples provided below show the potential impact of states having the authority to change the selected remedy. Since RODs contain an analysis of all remedies that were reviewed during the selection process, several Federal facility RODs were reviewed to determine which types of remedy changes are plausible at Department of Defense installations.

### Example 1

This example estimates the average cost of switching from one possible remedy to another. Instead of using the cost information presented in the RODs, the example uses RMIS-generated data to capture estimated future costs of the Department of Defense's program.

The Department of Defense analyzed a ROD with three alternative remedies: (1) no action, (2) use of institutional controls (ICs) only, and (3) use of a cap. Based on the RMIS-generated data, the average cost per site for ICs is \$1.7 million and the average cost per site for capping is \$4.4 million. The incremental cost for switching from ICs to capping is \$2.7 million per site. If 25 of 111 such sites were required to change from ICs to capping, the cost to complete would increase by \$67.5 million.

### Example 2

This example uses actual ROD cost estimates for each alternative remedy for a particular site. It assumes that a dissatisfied party would select the most expensive remedy alternative instead of the selected remedy. The Department of Defense reviewed a representative sample of RODs to generate the average cost difference, by site, of switching from one remedy to another.

Approximately 50 final Department of Defense installation RODs from 1996 were reviewed. The average cost difference between the selected remedy and the most expensive remedy is \$7.88 million. If 10 percent to 20 percent of Department of Defense sites had to change remedies (based on the ROD analysis), the potential cost increase for DERP would be \$43 million to \$85 million. This cost estimate does not include additional costs that could be incurred in changing a selected remedy, such as contractor stand-down costs, cost of performing more sampling, and costs of changing equipment to accommodate a new technology.